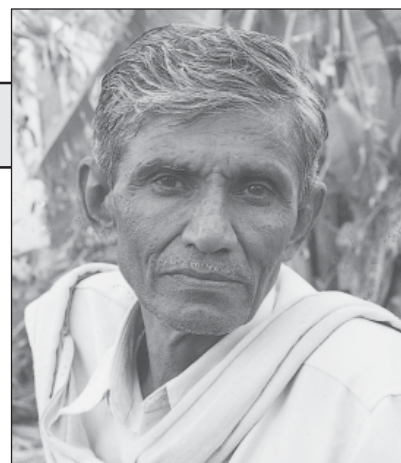


Reliance on on-farm resources



It was in the year 1923, in Switzerland, Dr. Rudolf Steiner, founder and promoter of Bio-Dynamic agriculture gave 8 lectures to a small group of farmers and agriculture scientists on how to grow healthy crop. During one of the lectures he had warned about the use of external inputs by saying that “a farm should be a self contained body and nothing should come from outside. If at all anything has to come it is only a seed or plant and only once and not the second time”. This principle is true not only for those who attended Dr. Rudolf Steiner’s lectures 82 years ago, but also for the whole of agriculture community for ever.

External inputs in agriculture production are not only uneconomical but also not locally available and accessible. Yet, it is unfortunate, that even small and marginal farmers are habitually purchasing all their inputs from the market. The funniest part of it is, they are purchasing 6 to 8 bamboo sticks, at the rate of Rs. 10 each, to drive their bullocks while ploughing. Instead, even if one farmer had planted a bamboo sapling at a slopy edge of his land, he would have had enough bamboo for making driving sticks for other farmers, making implements, baskets for packing, for creating storage structures and so on.

Replacing indigenous draught animals with external machinery like tractors has worsened the soil quality. Tractor use has encouraged hard crust formation just below 10 cms of the soil surface, hindering water percolation and penetration of roots deep into the soil. Instead, the cultivation by draught animals like bullocks, buffaloes, horses and donkeys, because of their light weight and lesser area of their feet stamping the soil, used to keep soil soft and porous, enabling increased water percolation and deeper penetration of roots into the soil.

The use of chemical nitrogenous fertilisers hastened the burning up of soil carbon, which is already higher in tropical countries compared to temperate zones. The decrease of the soil carbon below 2% in the farm land cannot maintain (host) microbial population and earth worm population resulting in loss of biological, physical and chemical activities in the soil, thus, having a direct influence on the crop yields. The use of chemical pesticides also has negative influences on the biological activities in the soil and reducing crop yields. It is said that a healthy soil would contain 4 cubic meters of root in 1 sq mm area (may upto a depth of 70 meters) and 1 gm of root would contain one billion microorganisms and one could calculate the amount of biomass produced in an acre of land and the quantity of humus converted in that area. Again, when chemical fertilisers are provided at the surface itself, the root-growth is discouraged. When plants get nutrition right at the surface they will not spread their roots deeper in search of nutrition. As far as my knowledge with agriculture science is concerned, I do not remember that much importance is given to the root growth compared to the prominence given to the canopy of the crops. I think that a plant should have the volume of root area (rhizosphere) equal to its canopy.

There is a common myth that food production is impossible without the use of agro-chemicals for a huge population. One of the important reasons for dependency on external inputs,

even by poor farmers, is the huge subsidy provided on agro-chemicals. Secondly, the farmers are not aware of the heavy and irreparable damage caused to the soil organisms and earth worms. Thirdly, there are wrong assumptions made about the nutritional requirements of crops.

Recycling of crop residues and animal excreta has to be given top most priority in crop production. The relationship of trees, animals, soil and water, has to be carefully understood and maintained. Everybody thinks that we need 4 to 5 animals (cattle or buffaloes) to be able to convert its wastes to get sufficient manure for an acre of land. However, animal excreta is only a catalyst in making compost. For example, we need only 150 kgs of any dung to make 3 tonnes of compost, the rest being 1500 kgs of good soil free from salinity and any natural biodegradable material weighing 1350 kgs. Similarly we can make 600% more nutritious vermi-compost with 15% to 20% dung and 80% of waste material. 200 litres of Jeevajal or Amritpani can be prepared with only 10 kg of animal excreta mixed with 10 litres of any animal urine, 2 kgs of jaggery, 2 kgs groundnut oil cake, 2 kgs of any cereal flour, 2 kgs of black gram flour and water, fermented for 10 days in a plastic or earthen pot in shade. This is sufficient for one acre for short duration crops like vegetables. Hence, the agriculture scientists, extension workers, NGOs and farmers in particular have to popularize the use of on-farm resources to make agriculture sustainable and also economically viable and save farmers from destruction.

L. Narayana Reddy

Srinivasapura, Via Maralenahalli,
Doddaballapura Taluk,
Hanabe – 561 203. Ph : 080 7651360

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